You have removed 5 polyps of various sizes from the colon of a 67-year-old female patient. Each of the polyps has a mutation in the APC gene. Mutation of this gene plays a role in carcinogenesis by increasing nuclear translocation of which mediator?

A. wnt
B. EGF
C. MLH1
D. B catenin
E. KRAS

Answer: D

Rationale: Germline mutations in the adenomatous polyposis coli (APC) gene are responsible for development of familial adenomatous polyposis syndrome and development of innumerable polyps on the colonic mucosa. APC mutations are also a common finding in sporadic colonic polyps. APC functions as one of a complex of proteins that binds and prevents nuclear translocation of b-catenin, which is responsible for cellular proliferation. Once bound by APC and these other proteins, b-catenin is ubiquitinated and sent to destruction by the proteasome. If APC is mutated, it cannot participate in this function and the concentration of b catenin increases in the cytoplasm, resulting in increased nuclear translocation and increased epithelial cell proliferation.